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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,480	02/28/2002	Kenichi Machida	112069.01	6693

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EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,480	MACHIDA, KENICHI	
	Examiner	Art Unit	
	Martin J Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 7/25/04

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3-6,9,12-16,19,22-26,29,32,34-37 and 40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3-6,12-16,22-26,32 and 34-37 is/are rejected.

7)☒ Claim(s) 9,19,29 and 40 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are presented after the first rejection to which they are directed. With respect to the photochemical hole burning media being used at low temperatures, the examiner reads this as an intended use limitation and therefore compositions, which can be cooled are held to be embraced by the language. The applicant may choose to exclude these by indicating that the medium is being held at low temperatures or perhaps 77 K using language from the specification (77 K is the temperature of liquid nitrogen). If the applicant does this, then the applicant should point to the basis in the specification relied upon for the language used. The rejections under the second paragraph of 35 U.S.C. 112 are withdrawn based upon the amendments to the claims. Other rejections of the previous office action, not repeated below are withdrawn based upon the arguments and amendments of the applicant. The examiner agrees that phenanthroline, which has only two binding sites and is a planar molecule is not a cryptand. (see Hawley's Condensed Chemical Dictionary, 14th Ed. pp. 222 and 311, citing "cavitands" and "cryptands" (2001) and IUPAC Compendium of Chemical Terminology, 2nd Ed. (1997), citation of "cryptand", cited and enclosed). The citation in the japanese chemical dictionary did identify cryptands and phenanthroline, but did not address in English for the record, what a Cryptand is. This issue has now been addressed and settled.

2. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 6 describes the electron donating composite compound as being an organic tin (Sn) compound. Claims 3, upon which it depends already identifies these a silane or disilazanes.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,3,4,12-14,32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi JP 09-227861.

Adachi JP 09-227861 (machine translation attached) describes a europium (III) phenanthroline complex in an ORMOSIL solgel matrix treated with an organic silane. (text and English abstract). The use of other ligands such as cryptands, crown ethers and the like are disclosed. (abstract and claim 1) The organic silane is held to be a reducing agent. The resultant composition is luminescent (fluorescent) (see abstract and text at [0001-0005]).

It would have been obvious to one skilled in the art to modify the example by using other ligands disclosed as useful to form the Eu complex, such as crown ethers, and cryptands in place of the phenanthroline with a reasonable expectation of achieving comparable results.

The applicant's analysis neglects the clear use of the term "cryptand" and "crown ether" in the English abstract and the specific showing of Eu (III) in section [0009] . The rejection stands.

5. Claims 1,3-5,12-15,32 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida JP 2000-345037 (machine translation enclosed) and Adachi JP 09-227861.

Machida JP 2000-345037 describes a europium (III) phenanthroline complex together with rhodamine in an ORMOSIL solgel matrix treated with hexamethyldisilazane, which renders it hydrophobic. ([0002-0003] and English abstract). The luminescence is described as improved due to the use of hexamethyldisilazane to treat the ORMASIL solgel matrix (see abstract, [0001-0003])

It would have been obvious to modify the example of Machida JP 2000-345037 by replacing the europium (III) phenanthroline complex with an europium (III) crown ether complex or europium (III) cryptand complex based upon the disclosure of equivalence of these ligands by Adachi JP 09-227861 and/or it would have been obvious to modify the example of Adachi JP 09-227861 by replacing the europium (III) phenanthroline complex with an europium (III) crown ether complex or europium (III) cryptand complex based upon the disclosure of equivalence by Adachi JP 09-227861 and to use the more hydrophobic ORMASIL matrix treated with hexamethyldisilazane, which renders it hydrophobic, which is taught by Machida JP 2000-345037 as resulting in improved luminescence.

6. Claims 1,3-5,12-15,32 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida JP 2000-345037 (machine translation enclosed) and Adachi JP 09-227861, further in view of Tsuboi et al., "synthesis and fluorescence properties of ...", J. Am. Ceram. Soc., Vol 81(5) pp . 1197-1202 and/or Ueda et al., "Preparation and persistent spectral holeburning properties of rrare earth complex dispersed in silica composite materials", Kidorui Vol. 36, pp. 262-263 (2002).

Tsuboi et al., "synthesis and fluorescence properties of ...", J. Am. Ceram. Soc., Vol 81(5) pp . 1197-1202 teach analysis of the emission spectra of Eu crown ethers in solgel matrices at room and low temperatures (77K).

Ueda et al., "Preparation and persistent spectral holeburning properties of rrare earth complex dispersed in silica composite materials", Kidorui Vol. 36, pp. 262-263 (2002) teach spectral holeburning at 77K and note the increased photoreduction of Eu(III) due to the crown ether ligands. Note the intensity as a function of temperature in figure 8.

In addition to the basis provided above, it would have been obvious to one skilled in the art to modify the combination of Machida JP 2000-345037 and Adachi JP 09-227861 by cooling the resultant matrix to 77K based upon the teachings of Tsuboi et al., "synthesis and fluorescence properties of ...", J. Am. Ceram. Soc., Vol 81(5) pp . 1197-1202 and/or Ueda et al., "Preparation and persistent spectral holeburning properties of rrare earth complex dispersed in silica composite materials", Kidorui Vol. 36, pp. 262-263 (2002) concerning improved luminescence intensity and the ability to perform spectral holeburning.

7. Claims 1,3-6,12-16, 22-26,32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida JP 2000-345037 (machine translation enclosed) and Adachi JP 09-227861, in view of Tsuboi et al., "synthesis and fluorescence properties of ...", J. Am. Ceram. Soc., Vol 81(5) pp . 1197-1202 and/or Ueda et al., "Preparation and persistent spectral holeburning properties of rrare earth complex dispersed in silica composite materials", Kidorui Vol. 36, pp. 262-263 (2002) and further in view of Che et al. '674 or Lin et al. EP 0263428.

Che et al. '674 teaches various precursors used to form sol gel glasses of silica, lithium oxide, magnesium oxide, alumina, titania, manganese oxide, tin oxides and antimony oxides

(2/20-43) to form mixed metal oxides. See also 3/30-40. The use of organotin compounds is also disclosed.

Lin et al. EP 0263428 teaches silicon oxides with titanium or zirconium oxides formed using sol gel methods. (abstract).

It would have been obvious to one skilled in the art to modify the processes of Machida JP 2000-345037 and Adachi JP 09-227861 combined with Tsuboi et al., "synthesis and fluorescence properties of ...", J. Am. Ceram. Soc., Vol 81(5) pp . 1197-1202 and/or Ueda et al., "Preparation and persistent spectral holeburning properties of rare earth complex dispersed in silica composite materials", Kidorui Vol. 36, pp. 262-263 (2002) as discussed above by forming mixed metal oxides using solgel methods such as those disclosed by Che et al. '674 or Lin et al. EP 0263428 with a reasonable expectation of forming the rigid matrices.

8. Claims 9,19,29 and 40 are objected to as being allowable over the prior art, but being dependent upon a rejected claim due to the tin compound recited in claim 9.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Martin J Angebranndt
Primary Examiner
Art Unit 1756